MANITOBA

Environmental Management Services

Pesticide Container Disposal Pilot Project Summer 1982

Programs, Legislation & Training

MG8159 a
REV. 82

PESTICIDE CONTAINER DISPOSAL

PILOT PROJECT

SUMMER 1982

EXECUTIVE SUMMARY

The Environmental Management Division operated a pilot project in South-Central Manitoba during the months of June, July and August, 1982 in order to discover an appropriate resolution of the problems associated with disposal of the estimated 500,000 metal agricultural chemical containers used each year in Manitoba.

The project was conducted in conjunction with the Municipal Corporations in the project area, whereby the local authorities established special compounds at 23 designated waste disposal grounds for the collection of the empty containers and advertised the project to the farmers.

The Environmental Management Division purchased two custom-built portable crushing units, rented two 1 ton stake trucks and through the use of four (4) STEP students undertook to service the compounds by crushing and draining the containers that had been deposited there.

There were many unanswered questions at the outset of the project and it is felt that the project, while not completely cleaning up South-Central Manitoba, was successful in providing the answers necessary to formulate some realistic observations and alternatives for dealing with the problem on a province-wide basis.

The pilot project revealed the acceptability of recycling shredded containers from a workplace safety and health perspective. It also made evident that a major cost consideration of any program option will be the ultimate disposal of the collected chemical residue.

BACKGROUND

Like most agricultural economies, the farm community of Manitoba has, over the past number of years, increased its emphasis on high productivity of lands. A major component of ensuring high yields is the use of agricultural chemicals for fertilizer and pest control. The use of these chemicals, however, is causing problems throughout Agro-Manitoba in that an estimated 500,000 20 litre metal containers are discarded annually. Experience shows that approximately 50 - 250 ml. of chemical remains in the bottom of unrinsed metal containers.

Although the Manitoba Department of Agriculture, in conjunction with the Environmental Management Division, has been actively advocating triple rinsing to commercial dealers and applicators, for economic, health and environmental reasons, many, if mot most, of the containers remain unrinsed.

The problem then is two-fold: solid waste and potential chemical residue contamination. For years the empty containers have been discarded in ditches, behind barns, at rural waste disposal grounds, on river banks, or in farmers' fields. As the concentration of containers gets higher in any location, the amount of residue increases, as does the potential for pollution of groundwater, as well as water in creeks, rivers or lakes.

Although there are litter regulations which deal with the indiscriminate dumping of waste, including empty containers, it does not sufficiently address this problem and a program specifically aimed at pesticide containers is required.

The Province of Manitoba, through the Environmental Management Division, recently completed a pilot project in co-operation with the municipalities in South-Central Manitoba (Appendix "A") in an effort to determine the viability of crushing and perhaps recycling the metal

containers. The project addressed both the environmental and workplace safety and health aspects of the problem.

THE PILOT PROJECT

The objective of the project was "To operate a pilot project for the disposal of metal pesticide containers in co-operation with the municipalities of South-Central Manitoba." Emphasis was on:

a) environmental acceptability;
b) workplace safety and health;
c) crushing. collecting and recycling viability; and
d) potential municipal resolution.

In the project area, the municipalities established compounds in conjunction with their waste disposal grounds and requested that the producers dispose of their rinsed metal containers at these compounds. The Environmental Management Division has two portable hydraulic crushers that were taken from compound to compound, draining and crushing the containers found therein.

The crushing units were designed jointly by the Environmental Management Division staff and the manufacturer, Canadian Rogers Western (1971) Limited. Powered by eight (8) horsepower gas motors, the crushers compact 20 litre metal containers while forcing out pesticide residue or other liquid.

The ultimate intent of the pilot project was to establish a recycling system for pesticide containers. To this end, the Environmental Management Division has co-operated with Workplace Safety and Health and conducted an experiment to determine the acceptability of shredding

and eventually recycling of the containers through the rolling mills. The results of that experiment indicate that recycling is an acceptable process from a workplace safety and health perspective.

There were many unanswered questions at the outset of the project, and it is felt that the project, while not completely cleaning up South-Central Manitoba, was successful in providing the answers necessary to formulate some realistic observations and recommendations for dealing with the problem on a province-wide basis. Appendix "B" provides project specifics.

QUESTIONS AND ANSWERS

Some of the questions and answers provided by the project follow:

1. Is the problem of a sufficient size to warrant continual attention through some sort of disposal program?
   Answer: Yes.

2. Do the municipal corporations appear willing to co-operate in finding a resolution to this problem?
   Answer: Yes, they were most co-operative in establishing compounds and advertising the project.

3. Are the farmers willing to take their empty containers to the waste disposal ground?
   Answer: Yes, although we have no way of knowing the numbers of containers not brought to the compounds.

4. Are the farmers willing to sort the metal from the plastic containers and other garbage they deliver to the waste disposal ground?

Answer: Some are, but others dumped everything in the container compound, decreasing the efficiency of the project.

5. Is recycling through the rolling mills an acceptable disposal alternative from a workplace safety and health perspective?

   Answer: Yes, provided the containers go through the shredding process prior to going to the rolling mills. Further residues investigation may have to be conducted on the waste created at the shredding mill.

6. Are the portable crushers sturdy and effective?

   Answer: Yes, there were some minor mechanical problems that were easily rectified. Although the process is slow and labour intensive, the alternatives would require major capital outlays. The design of the crushers with the puncture mechanism prior to crushing effectively drains the containers of liquid residue.

7. Can a program be designed to resolve the problem on a province wide basis?

   Answer: Yes, there are various alternatives open. It should be recognized, however, that it is a major undertaking and will have economic implications.

8. Are the educational efforts to persaude the users to triple rinse effective?

   Answer: No. Although specific records were not taken, it is estimated that at least 50% of the containers were not rinsed. It should be noted that the educational emphasis to date has been with commercial applicators not individual farmers.

9. What about disposal of the residue?

   Answer: This will be a major and costly undertaking. Approximately 25 - 200 litre drums (filled 3/4 full) were collected from this pilot project (30,000 crushed containers). Projecting this rate (125 ml./cont.) throughout the province (500,000 containers annually). approximately 6,500 litres of residue would require disposal at an estimated cost of $84,500. ($260./200 l. drum).

OBSERVATIONS

Further to response to specific questions, the experience during the pilot project prompts the following observations.

1. From the perspective of answering the questions in the previous section, the pilot project on pesticide container disposal was a success.

2. Unfortunately, the project area chosen was overly optimistic and the pilot was not successful in completing the task of crushing and draining all of the containers in the compounds.

3. The magnitude of the problem, on a provincial scale is such that some resolution is required. Because the program would necessarily be a massive undertaking, it would appear that a co-operative approach between the public and private sector would be the most suitable.

4. The market for the crushed containers is highly volatile. In 1981, the price for one ton of containers delivered to the car shredder was $35.00. This summer the value had dropped to $20.00 or less.

5. While we had suggested fenced compounds for the deposit of containers, the fencing was, in many instances, unnecessary and cumbersome. The desirable location of the crusher often varied due to wind direction, configuration of the pile of containers, etc. It was felt that the security offered by the fenced compounds was insignificant and caused more problems than it was worth. The ideal locations had a special area set aside, away and preferrably upwind of the waste disposal ground - and well marked.

6. It is important to request municipalities to adequately post notices requesting farmers to separate garbage and plastic containers from the metal ones. Many hours were rendered unproductive, while sorting plastic, cardboard and household garbage from the metal containers.

7. It is important to adequately check out the location of the compounds for containers to ensure they are not in low, wet areas, with potential ponding or drainage problems.

8. It was apparent that the use of plastic containers is on the increase. Although no count was taken, it is roughly estimated that plastic containers at the waste disposal grounds represented between 20 and 30 per cent of the total. A random sample of plastic containers were checked for residue, and it was found that few of those checked were rinsed and a signficant amount (50-150ml) of residue remained in most of the containers.

   Although the design of the plastic containers is such that they can be efficiently rinsed, and should be effectively drained even from a thirty second inversion, it was apparent that neither of these emptying techniques was extensively used.

   The issue of plastic agricultural chemical containers will need to be addressed separately as a different disposal method will be required.

9. Interest in the project was positive, with numerous radio, television and newspaper reports throughout its duration.

APPENDIX A.

SWAN RIVER
DAUPHIN
MINNEDOSA
BRANDON
SOURIS
PORTAGE LA PRAIRIE
SELKIRK
STEINBACH
MORDEN
LAKE WINNIPEG
MANITOBA

APPENDIX B

Summary of Activity

Location	Number of Containers	Volume of Residue
St. Francis Xavier		
A. St. Francis Xavier		
- completed in June	230	15
- completed in July	531	99
Cartier		
A. Elie		
- completed in June	195	20
- completed in August	749	130
Morris		
A. Sperling		
- completed in June	810	110
B. Rosenort		
- completed in July	660	85
C. Lowe Farm		
- completed in June	887	70
D. Morris		
- completed in June	269	30
Dufferin		
A. Carman		
- completed in June	2300	230
- partially completed in August (approximately 1500 - 2000 containers remain)	875	110
B. Roseisle		
- inaccessible in July. A request was made to correct the situation. No response to request. Estimate approx. 500 cans in July.		

APPENDIX B (cont'd)

Grey		
A. St. Claude		
- completed in July	128	10
B. Elm Creek		
- completed in July	1100	175
Roland		
A. Roland		
- completed in July	1200	170
Thompson		
A. Miami		
- 1/3 completed in August	283	50
MacDonald		
A. Sanford		
- completed in June	800	40
- serviced in July and August	234	22
- left uncompleted because of odour in Waste Disposal Ground	254	20
B. Brunkild		
- completed in June	1300	65
- completed in August	600	75
	1934	185
C. Starbuck		
- completed in June	170	25

APPENDIX B (cont'd)

Stanley		
A. Winkler		
- ½ completed in August	680	115
B. Morden		
- ½ completed in July	450	150
Rhineland		
A. Plum Coulee		
- completed in August	2494	600
B. Altona		
- visited in August	533	115
- access impossible as most cans crushed by a cat		
Pembina		
A. Manitou		
- completed in July	1768	245
	857	200
B. Darlingford		
- completed in July	2500	235
C. Snowflake		
- completed in July	1029	230
Portage la Prairie		
A. High Bluff		
- nearly complete in July	1312	268
- rain flooded site - did not return		
	29340	4204 litres

APPENDIX C

The Environmental Management Division purchased two custom designed and built portable crushers from Canadian Rogers Western (1971) Ltd The machines were specifically designed to be easily on and off loaded from a one-ton stake truck such that the engine and hydraulic controls remain in the truck, with the actual crushing mechanism on the ground. The trucks had capability to carry several 200 litre containers for residue.

The machine consists of two hydraulic cylinders, one located at the side of the stationary base plate on which the containers rest, and the other vertical to drive the crushing plate. The lower hydraulic drives a puncture pin into the base of the container just prior to the descent of the crushing plate. The upper and lower plates of the crusher seal the container so that the only air escape is through the puncture. The action of the container being crushed compresses the air and forces it, and any remaining residue, out of the container through the punctured hole. A portable container catches the residue which was subsequently transferred to 200 litre drums for storage prior to ultimate disposal.

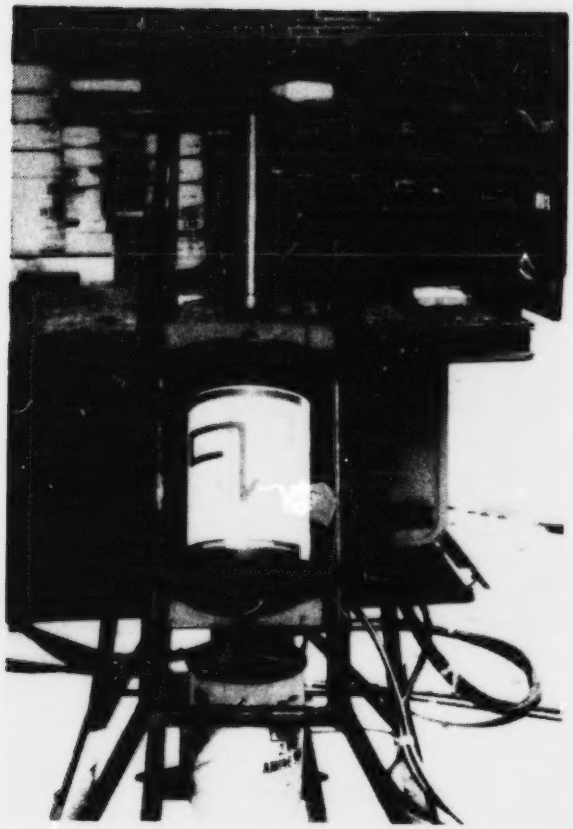
APPENDIX D

The personnel involved in the project were protected on the job through the use of protective equipment which they were required to wear. The protective equipment consisted of:

- hard hat
- noise resisters
- plexiglass face shield or goggles
- agricultural respirators
- rubber boots
- high rubber gloves
- rubber aprons

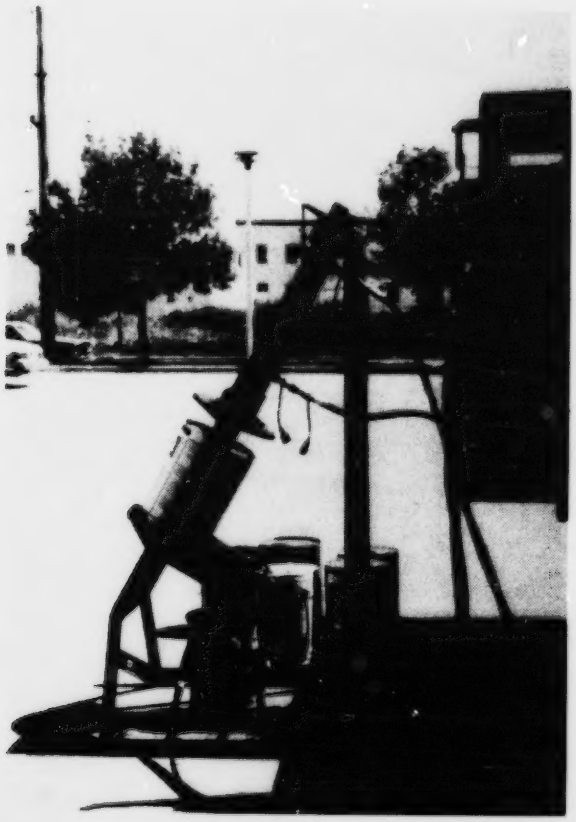
The person handling containers was required to wear the full equipment, while the person operating the hydraulics from the truck was permitted to set some equipment aside. For the most part, the equipment was worn at all times.

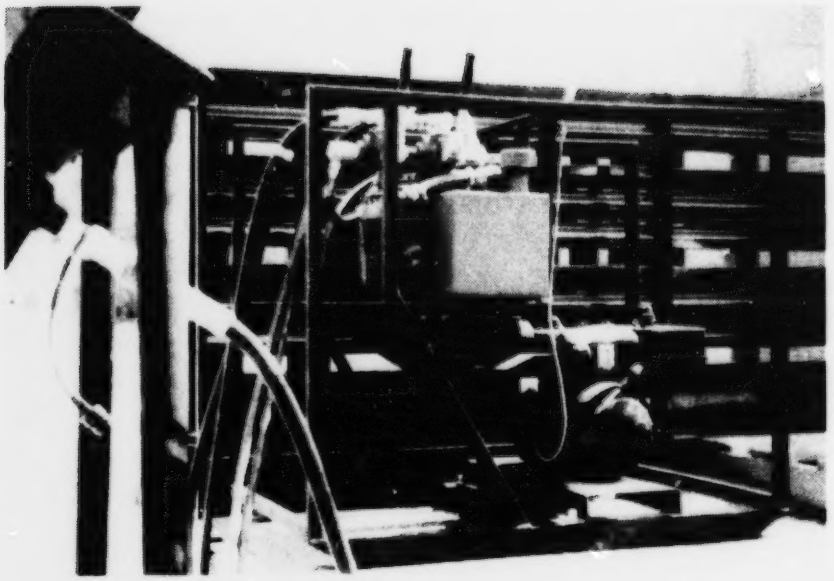
The personnel were also required to undergo bi-weekly cholinesterase level blood tests. Throughout the duration of the project, all results were within the normal range.



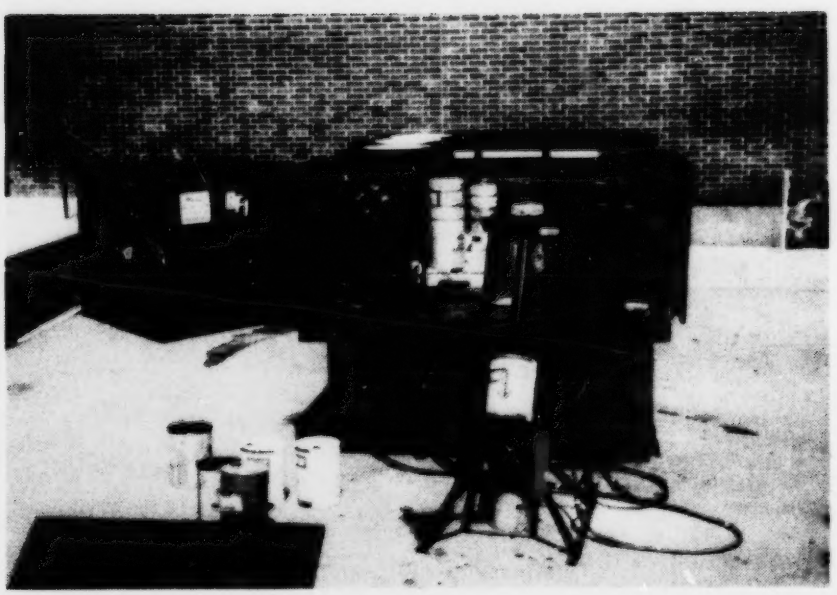
FRONT VIEW - CRUSHER

SIDE VIEW - CRUSHER





POWER PAC AND HYDRAULICS

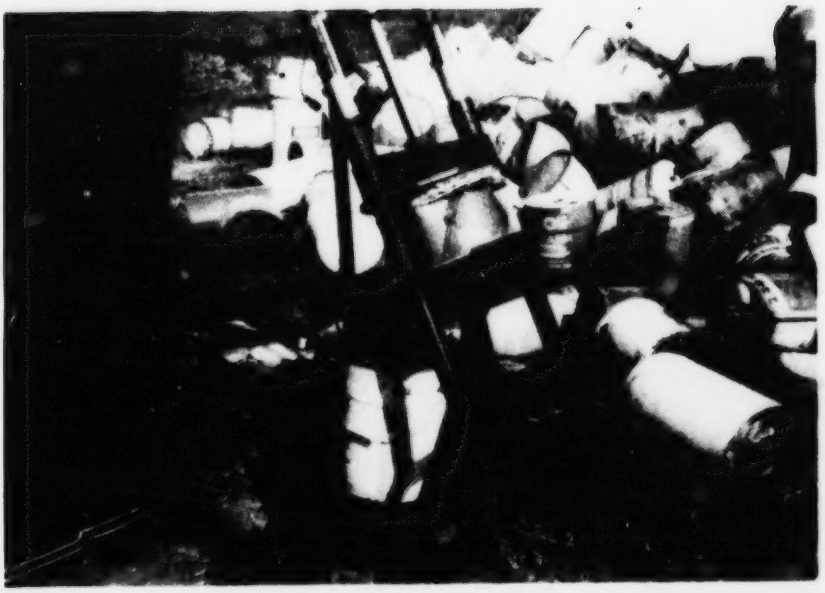


COMPLETE UNIT

UNLOADING CRUSHER

SETTING UP

READY TO GO



CRUSHER - MID-CYCLE - NOTE RESIDUE